MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

SUPPLEMENTARY EXAMINATION

TRIMESTER 1, 2015/2016

TIS3151/ TRQ3211 – SOFTWARE RELIABILITY AND QUALITY ASSURANCE

(All sections / Groups)

18 NOV 2015
9.00 AM – 11.00 AM
(2 HOURS)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 6 pages excluding the cover page with 5 Questions only.

2. Attempt all **FIVE** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please print all your answers in the Answer Booklet provided.

QUESTION 1

a. One of the differences between hardware and software product is product visibility. Discuss the ways in which this difference affects SQA.

[2 Marks]

b. Teamwork is the basis for the success of a software development. Explain THREE factors that motivate the establishment of a project team.

[3 Marks]

c. The member registration system allows only the manager to access members' information and members are allowed to access their information only when the username and password matches. Furthermore, the system is designed to operate in both Windows and Linux environment. Indicate which TWO McCall's quality factors best describe this example.

[3 Marks]

d. It has been claimed that environmental characteristics create the need for intensive and continuous managerial efforts parallel to the professional efforts that have to be invested in order to ensure the project's quality or, in other words, to assure the project's success. Discuss FOUR reasons behind this claim, including an analysis of the managerial effort created by each of the SQA environmental characteristics.

[4 Marks]

QUESTION 2

a. Biometric is an automated process which is used to recognize individuals based on biological and behavioral characteristics. Identify failure classes for each situation below. Justify your answer.

i. Occasionally, the biometric system fails due to poor-quality biometric samples.

[2 Marks]

ii. The biometric system fails for all types of input regardless of the quality of the samples and the state of biometric hardware and software.

[2 Marks]

....continued

b. Timothy is an exceptional programmer who practices information hiding in his code. After analyzing the following code written by his peer, he found that the concept of information hiding was not implemented in the code.

```
/* File name : InMain.java */
public class InMain{
public static void main(String args[]){
     FuncCall f = new FuncCall();
     f.setID("11111000");
     f.setGender("Female");
     System.out.print("ID:"+f.getID()+
     " Gender:"+ f.getGender());
  }
}

/* File name : FuncCall.java */
public class FuncCall {

public String ID;
public String gender;

public String getGender(){
return gender;
   }

public String getID(){
return ID;
   }
public void setGender( String gender){
this.gender = gender;
   }
public void setID(String ID){
this.ID = ID;
   }
}
```

i. Explain the term information hiding.

[1 Mark]

ii. Correct the program above to ensure that the concept of information hiding is implemented.

[2 Marks]

....continued

c. IntelliSoft Inc. management gives importance to build reliable software along with adhering to HSE (Health- Safety Environment) requirements to ensure that the software will not cause accidents or damages.

i. Explain why reliable software may not be safe to use?

[3 Marks]

ii. Differentiate between the terms 'accident' and 'damage'.

[2 Marks]

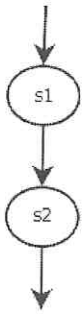
QUESTION 3

a. XT Company is a new enterprise recently started by a few young entrepreneurs, intended to develop robotic systems using IT based solutions. RoBotLits is a well-established automobile manufacturing plant interested in automating some of the operations of the plant. As first step towards automation, RoBotLits has decided to deploy a robotic arm to pick and place large number of bolts from one tray to another tray. RoBotLits has asked XT Company for demonstrating the robotic arm as a proof of concept.
This is the first project being executed by XT Company. RoBotLits would like to have a first experience of the robotic arm before signing the MOU (Memorandum of Understanding) with XT Company as well as to ensure that XT Company will be able to deliver highly reliable product. After MOU sign-off, RoBotLits would provide the complete set of requirement of the robot.

In your opinion, what is the best software development life cycle model that XT Company can adopt to fulfill RoBotLits's requirements? Justify your answer.

[3 Marks]

b. Consider the flow graph below which shows the path coverage between module 1 and module 2.



Suggest a way on how to perform a unit or integration testing if module s2 is yet to be developed. Justify your suggestion.

[3Marks]

....continued

c. What is the contribution of outside experts to the performance of a review task?

[2 Marks]

d. The preparations made by members of 'Inspection teams' are considered to be of greater depth and thoroughness when compared with the preparations for 'walkthroughs'.

(i) What activities are included in such high levels of preparations?

[2 Marks]

(ii) Do you think inspection teams having 15 members can achieve similarly high levels of preparation?

[2 Marks]

QUESTION 4

a. Mr. Brown has been assigned to carry out the application of ***quality metrics*** in the organization. As a manager, what would be his responsibilities to ensure the work is carried out in a proper way?

[4 Marks]

b. Housten Inc. a software house wants to apply a tender for a large software project. What type of metrics would they use for the measurement of ***Size***? Why?

[4 Marks]

c. Nazrul Khan is involved in the Verification and Validation (V&V) process. When results of the exercise are obtained, he needs to know to whom these results need to be sent. Which document does he need to refer to? Why?

[4 Marks]

QUESTION 5

a. One of the fundamental principles of Total Quality Management (TQM) is to 'listen to the voice of the customer'. Identify SIX ways in which you could get to know the needs of the customer?

[3 Marks]

b. Often a software development house must adapt or create their software in the presence of new technology. There is always the potential risk that it will take longer than planned to create this software. How would you minimize this risk?

[2 Marks]

....continued

c. Distinguish between Reactive and Proactive risk management.

[4 Marks]

d. In building a risk table three important components are included: Risk mitigation, risk monitoring and risk management. What do these three components address?

[3 Marks]

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